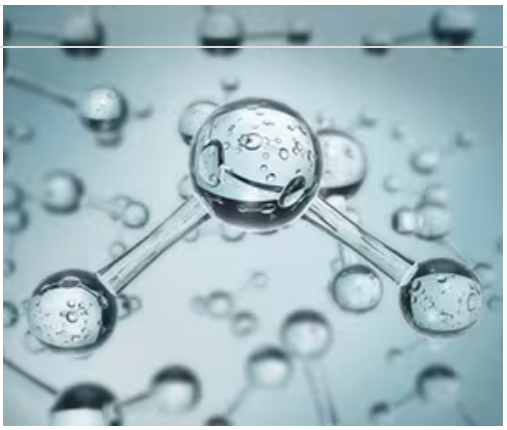
Nuclease-Free Water



Nuclease-free water is water that has been deionized, filtered, autoclaved, and tested for contaminants, such as endonucleases, exonucleases, and RNases. This water is rigorously tested to be certified nuclease-free, which includes DNases and RNases.

Nuclease contamination in reagents used for nucleic acid isolation and analysis can contribute to experimental inconsistency and sometimes even experimental failure. In trying to pinpoint the sources of contamination, it is easy to overlook the water used either to prepare reagents or to resuspend precipitated RNA.

Even purified water can have a high pH and minerals that can interfere with reactions that require specific salt and pH conditions. We offer several brands and grades of nuclease-free water—diethyl pyrocarbonate (DEPC)-treated water, nuclease-free water (not DEPC-treated), RT-PCR grade water, and UltraPure distilled water. All have been rigorously tested for contaminating non-specific endonucleases, exonucleases, and RNase activity.

Maintaining an RNase-free lab | **Nuclease-free buffers and reagents**

What is the difference between nuclease free water and distilled water?

The difference between nuclease free water and distilled water is nuclease-free water is specifically treated and tested to be free of nucleases. While both distilled water and nuclease-free water are high-purity forms of water, nuclease-free water is more suitable for applications that require the protection of nucleic acids from degradation.

DEPC-treated

Diethyl pyrocarbonate treated water

Diethyl pyrocarbonate (DEPC) treated water contains a chemical used to inhibit RNases. DEPC-treated, nuclease-free water should have the following features:

- Autoclaved, membrane-filtered
- Tested RNase- and DNase-free water
- Autoclaved pre- and post-packaging for inactivation of DEPC

Membrane-filtered water and autoclaved for DEPC inactivation

Autoclaving alone may be sufficient to inactivate a substantial amount of RNase enzyme, depending on the downstream applications. However, if your downstream assays are sensitive, DEPC-treated nuclease-free water is a better option. It is added to the deionized water, which is then autoclaved, inactivating the chemical DEPC.

Learn more about RNase and DEPC

Why is DEPC treated water not recommended for PCR?

DEPC-treated water is not recommended for PCR because the diethyl pyrocarbonate chemicals can interfere with the PCR reaction by inhibiting the DNA polymerase activity.

While DEPC-treated water is effective for inactivating RNases and is useful for RNA-related experiments, it is not recommended for PCR due to the potential presence of residual DEPC and its by-products, which can inhibit the PCR enzymes and compromise the reaction. Instead, **nuclease-free or PCR-grade water** should be used for PCR to help ensure optimal performance and reliability.

Ordering information for DEPC-treated water

Catalog # AM9916

Name DEPC-Treated Water, 5 x 100 mL

Size Each

Price (USD)

141.65

Special offer

Online exclusive

Ends: 01-May-2025

~~156.00~~

Save 14.35 (9%)

Qty

Add to cart

Catalog # AM9922

Name DEPC-Treated Water, 1 x 1000 mL

Size Each

Price (USD)

114.03

Special offer

Online exclusive

Ends: 01-May-2025

~~125.00~~

Save 10.97 (9%)

Qty

Add to cart

Catalog # AM9920

Name DEPC-Treated Water, 1 x 500 mL

Size Each

Price (USD)

87.00

Special offer

Online exclusive

Ends: 01-May-2025

~~97.75~~

Save 10.75 (11%)

Qty

Add to cart

Catalog # AM9915G

Name DEPC-Treated Water, 1 x 100 mL

Size Each

Price (USD)

46.77

Special offer

Online exclusive

Ends: 01-May-2025

~~51.25~~

Save 4.48 (9%)

Qty

Add to cart

Catalog # AM9906

Name DEPC-Treated Water, 10 x 50 mL

Size Each

Price (USD)

145.65

Special offer

Online exclusive

Ends: 01-May-2025

~~165.00~~

Save 19.35 (12%)

Qty

Add to cart

Catalog # 4387937

Name DEPC-Treated Water, 4 x 1000 mL

Size Each

Price (USD)

228.73

Special offer

Online exclusive

Ends: 01-May-2025

~~257.00~~

Save 28.27 (11%)

Qty

Add to cart

Non DEPC-treated

RT-PCR grade water

ase-/RNase-free water

How Thermo Fisher specially treats and tests their nuclease-free water

To meet the special challenges of working with RNA, Thermo Fisher water is certified nuclease-free. They are Type II 18-megohm filtered (via state-of-the-art reverse osmosis filtration and deionization), followed by autoclaving and membrane filtration. The purification equipment used to produce Thermo Fisher waters is subjected to routine maintenance and testing procedures according to rigid ISO 9001 specifications.

Resources

The basics: RNase control

The basics: RNA isolation

RNA reference guide

Working with RNA

Top ten ways to improve your RNA isolation

Technical bulletins

Nuclease and protease testing

RNase and DEPC treatment: Fact or laboratory myth?

TechNotes articles

Detect RNases before they ruin your experiment: New 30-minute test for verifying that common lab solutions are RNase-free

Measuring RNase activity—A real-time kinetic analysis: Detect nuclease and standardize enzyme activity

The right choice for protecting your RNA: New ribonuclease inhibitor that inhibits a broader range of RNases over a broader range of conditions than traditional RNase inhibitors

Which water to use?: Don't overlook the water used in the experiment when trying to pinpoint the source of RNase contamination

Support

Nucleic Acid Purification and Analysis Support Center

Contact Technical Support

Commercial Licensing Information

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